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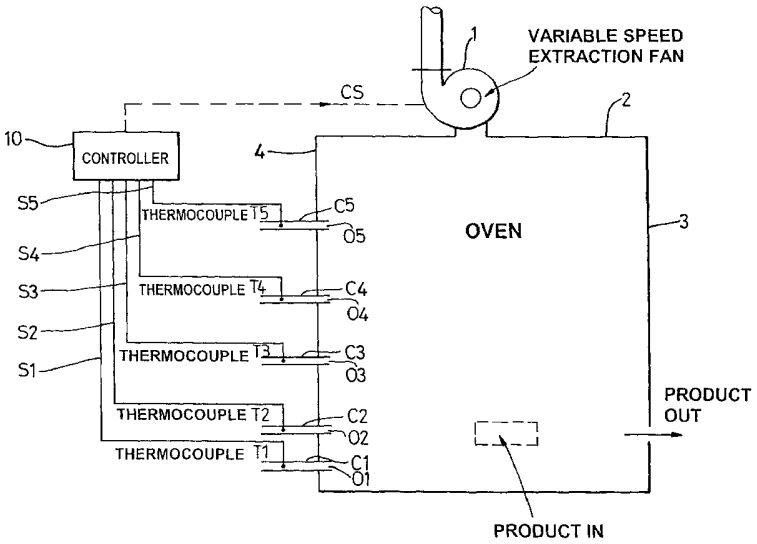
[Continued on next page]

(54) Title: CONTROL SYSTEMS FOR TEMPERATURE-CONTROLLED ENCLOSURES



(57) Abstract: Method and apparatus of controlling the movement of air into and out of the ends of a conveyor oven, the method comprising monitoring the temperatures of the air within a plurality of conduits (Cl, C2, C3, C4, C5) extending through the oven casing (3) to positions (01, 02, 03, 04, 05) internal to the oven casing, in order to determine by measurement of temperature by respective thermocouples positioned externally of the oven casing which conduits are conveying hot air out of the oven, and which conduits are conveying cold air into the oven, and controlling air flow through the oven by way of a variable speed extraction fan (1) in response to the temperature measurements.

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Published:

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INTERNATIONAL SEARCH REPORT

Interna Application No
PCT/GB2004/003866

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A21B1/48 A21B3/02 G05D16/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A21B G05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 267 131 B1 (MASADA MUTSUO ET AL) 31 July 2001 (2001-07-31) column 3, line 48 - column 5, line 17; figure 1 -----	1-9
A	US 2001/054548 A1 (KRESS EDWARD S) 27 December 2001 (2001-12-27) paragraphs [0015] - [0023]; figures 1-3 -----	1-9
A	US 5 398 666 A (SMITH DONALD P ET AL) 21 March 1995 (1995-03-21) the whole document -----	1-9
A	US 2 265 210 A (WADDELL BENSON F) 9 December 1941 (1941-12-09) the whole document -----	1-9

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 January 2005	22. 07. 2005

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Merkt, A

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

Intern Application No
PCT/GB2004/003866

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 419 213 A (PATENTSMITH II INC) 27 March 1991 (1991-03-27) the whole document -----	
A	US 3 799 736 A (PALLADINO F,US) 26 March 1974 (1974-03-26) column 2, lines 30-48; figure 1 column 3, lines 33-49 -----	10-17, 20,21
A	US 5 172 848 A (BARTEN ET AL) 22 December 1992 (1992-12-22) the whole document -----	10-17, 20,21
A	GB 755 237 A (T. & T. VICARS LIMITED; JOSEPH FRANCIS NAYLOR; JOHN EATON) 22 August 1956 (1956-08-22) the whole document -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2004/003866

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-17, 20-21

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-17 and 20-21

   A method for monitoring the pressure of a location within the interior of a temeprature-controlled enclosure, a control system for a conveyor oven using said method, a method of controlling the movement of air into and out of the ends of a conveyor oven using said method and a multi-zone oven using the first mentioned method.

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2. claims: 18-19

   A control system for a temperature-controlled enclosure with thermic comparators.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internl Application No
PCT/GB2004/003866

Patent document cited in search report		Publication date	Patent family member(s)			Publication date
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			DE	69021308	T2	14-03-1996
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